

DOCKET NO.: DMCI-0099
Application No.: 10/087,714
Office Action Dated: December 8, 2003

PATENT

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Canceled)

2. (Canceled)

3. (Canceled)

4. (Canceled)

5. (Canceled)

6. (Canceled)

7. (Canceled)

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Canceled)

12. (Canceled)

13. (Canceled)

14. (Canceled)

15. (Canceled)

16. (Original) A method for improving vanillin production in *Vanilla planifolia*, which comprises genetically engineering the *Vanilla planifolia* to overproduce one or more enzymes associated with one or more steps of vanillin biosynthesis in the *Vanilla planifolia*, the steps selected from the group consisting of: chain shortening of p-coumaric acid to p-hydroxybenzaldehyde; chain shortening of ferulic acid to vanillin; hydroxylation of p-hydroxybenzyl alcohol to 3,4-dihydroxybenzyl alcohol or aldehyde; and methylation of 3,4-dihydroxybenzaldehyde to vanillin.

17. (Original) The method of claim 16, wherein the enzymes are selected from the group consisting of: at least one p-hydroxybenzaldehyde synthase; at least one cytochrome p450 monooxygenase; and at least one methyl transferase.

18. (Original) The method of claim 16, wherein the enzyme comprises SEQ ID NO:2 or a functional variant thereof.

19. (Original) The method of claim 18, wherein the enzyme is encoded by SEQ ID NO:1.

20. (Original) The method of claim 16, wherein the genetically engineered *Vanilla planifolia* is a cell or tissue culture.

21. (Original) The method of claim 16, wherein the genetically engineered *Vanilla planifolia* is a whole plant.

22. (Original) A genetically engineered *Vanilla planifolia* cell produced by the method of claim 16.

23. (Original) The cell of claim 22, which produces at least twice as much vanillin as does an equivalent cell which is not comparably genetically engineered.

24. (Original) A genetically engineered *Vanilla planifolia* plant, regenerated from the cell of claim 22.

25. (Original) The plant of claim 24, which produces at least twice as much vanillin as does an equivalent plant which is not comparably genetically engineered.

26. (Original) A method for improving vanillin accumulation in cell or tissue culture of *Vanilla planifolia*, which comprises inhibiting production or activity of vanillyl alcohol dehydrogenase in cells comprising the cell or tissue culture, the inhibition resulting in the improved vanillin accumulation.

27. (Canceled)

28. (Canceled)

29. (Canceled)

30. (Original) A method for improving vanillin production and accumulation in a *Vanilla planifolia* cell or tissue culture, which comprises:

a) genetically engineering the *Vanilla planifolia* to overproduce one or more enzymes associated with one or more steps of vanillin biosynthesis in the *Vanilla planifolia*, the steps selected from the group consisting of: chain shortening of p-coumaric acid to p-hydroxybenzaldehyde; chain shortening of ferulic acid to vanillin; hydroxylation of p-hydroxybenzyl alcohol to 3,4-dihydroxybenzyl alcohol or aldehyde; and methylation of 3,4-dihydroxybenzaldehyde to vanillin, thereby resulting in the improved vanillin production; and

b) inhibiting production or activity of vanillyl alcohol dehydrogenase in cells of the culture, thereby resulting in the improved vanillin accumulation.

DOCKET NO.: DMCI-0099

PATENT

Application No.: 10/087,714

Office Action Dated: December 8, 2003

31. (Original) A *Vanilla planifolia* cell or tissue culture produced by the method of claim 30.